As a principal participant in the nation's Stockpile Stewardship Program, Livermore is committed to maintaining confidence in the safety and reliability of the U.S. nuclear weapons stockpile. The program is extraordinarily demanding because the nuclear weapons in the stockpile continue to grow older, and we are challenged to ensure their performance and refurbish them as necessary without conducting nuclear tests.

The Stockpile Stewardship Program integrates the activities of the U.S. nuclear weapons complex, which includes Livermore, Los Alamos, and Sandia national laboratories as well as the four production sites and the Nevada Test Site.

Stockpile Stewardship— Attending to Stockpile Needs

The Laboratory's activities involve weapons systems in all three legs of the U.S. strategic triad. We are completing the Life Extension Program for the W87 ICBM warhead; we are the design laboratory for the B83 bomb; we are beginning life-extension work on the W80 cruise missile warhead; and we are an integral part of the SLBM Protection Program.

Certifying Stockpile Safety and Reliability

In April 2000, the Secretaries of Energy and Defense certified to the President that the U.S. nuclear stockpile is safe and reliable and that no nuclear tests are needed at this time. This formal annual certification, which was the fourth since the inception of the Stockpile Stewardship Program, was based on technical reviews and independent evaluations conducted by Livermore, Los Alamos, and Sandia national laboratories. It is our responsibility to provide the President with accurate assessments of the safety, reliability, and performance of each weapon system in the nation's nuclear stockpile.

Final Certification of W87 Nears Completion

Livermore's W87 Life Extension Program, begun in late 1994, met all its major milestones. Refurbished W87s are being delivered to the Air Force after assembly at the Pantex Plant. Refurbishment of the W87 ICBM warhead (the design with the most modern safety features in the stockpile) extends the lifetime of the weapon to beyond 2025.

The Laboratory's activities are directed toward final certification of the restockpiled weapons, which is expected in 2001. In summer 2000, we finished a final set of ground tests. We also flight-tested production verification units aboard a Peacekeeper missile launched in March 2000. No additional nuclear testing of the W87 is required to assure system reliability. Assessment of nuclear performance and subsequent certification are based on computer simulation, past nuclear tests, and new aboveground experiments that address specific physics issues.

Growing Stockpile Responsibilities

Lawrence Livermore and Sandia Livermore are assuming responsibility for the W80 Life Extension

With construction completed, the Contained Firing Facility at Site 300 (left) is undergoing qualification testing to assure the facility's ability to contain debris from hydrodynamic tests of mock weapon primaries. With the flash x-ray machine (right) taking multiple images during each experiment, the facility is designed to conduct tests that use up to 60 kilograms of high explosives.

Program. The W80, designed by Los Alamos, is deployed in air-launched and sea-launched cruise missiles. Plans for this life-extension program will draw on the results of a W80 Dual Baseline study, an in-depth assessment of refurbishment options to be completed by Livermore, Los Alamos, and Sandia in FY 2001. The schedule calls for the first production unit of the refurbished warheads in FY 2006. As refurbished W80 units enter the stockpile, Livermore will be responsible for continuing evaluations of their performance. Los Alamos will retain this responsibility for W80s not yet refurbished.

In addition, pits from Livermore-designed weapons will now be thoroughly examined at facilities for handling special nuclear materials in Livermore's Superblock. These stockpile surveillance activities previously had been conducted at Los Alamos.

Reassignment of responsibilities for the W80 and pit surveillance better balances activities at the two laboratories to maintain the performance of stockpiled weapons. These new activities supplement the W87 Life Extension Program and our work with the U.S. Navy on an SLBM Warhead Protection Program. That program, now nearing completion, has been a five-year development effort by the NNSA laboratories to examine warhead pit reuse to meet the Navy's future warhead needs. Activities have included analyses, extensive ground testing, and a high-fidelity flight test conducted in April 2000 to measure flight dynamics.

Independent Reviews of Weapon Systems

With publication of Livermore's W76 Dual Revalidation Report in April 2000, the Laboratory completed its responsibilities in a four-year-long reevaluation of the W76 SLBM warhead. The dual revalidation consisted of assessments by Los Alamos, which designed the warhead, and Livermore, which pursued extensive experimental and computational work to evaluate W76 performance.

In the absence of nuclear testing, the nation increasingly must rely on independent assessments by the NNSA laboratories—whose expert judgment is supported by computational models and experimental tools—to ensure the safety and reliability of weapons in the stockpile.

At Livermore's Hardened Engineering Test Building, specialists from the two laboratories prepare a drop test to validate the shock load performance of the Los Alamos–designed B61 earth-penetrator bomb.